Registration of Reliable Sandberg Bluegrass Germplasm

Reliable Sandberg bluegrass (*Poa secunda* Presl.) germplasm (Reg. no. GP-8, PI 639272) was released on 12 Oct. 2004 by the USDA-ARS and the Utah Agricultural Experiment Station as a Selected Class (natural track) germplasm, which is eligible for seed certification under Association of Seed Certifying Agencies guidelines (AOSCA, 2001). Reliable was developed in cooperation with the United States Army Corps of Engineers– Engineer Research and Development Center and the Strategic Environmental Research and Development Program (SERDP) project to identify resilient plant characteristics and develop wear-resistant plant cultivars for use on military training lands. Reliable Sandberg bluegrass is a multi-origin germplasm assembled to ensure adaptation over a broad range of ecological sites and provide a source of readily available seed. Reliable was evaluated under the experimental designations SERDP-select, Yakima, and YTC Sandberg bluegrass.

Sandberg bluegrass reproduces via facultative apomixis (Kellogg, 1987), theoretically resulting in fixed adaptation to specific environments. Reliable is a multi-origin germplasm generated by compositing seed from plants originating from 28 locations, with each location potentially containing unique co-adapted gene complexes. Three hundred fourteen Sandberg bluegrass plants were collected as live plants on 25–26 Aug. 1998 from 28 locations representing seven different ecological sites, as classified by the USDA-Natural Resources Conservation Service, at the U.S. Army Yakima Training Center (YTC) at Yakima, WA. The collection locations had the following range of characteristics: annual precipitation (12–30 cm); surface soil texture (loam to sand); soil depth (15–183 cm); slope (0–45%); aspect (north, south, east, and west); and elevation (243–1034 m). Land forms of the collection locations were foot hill, plain, canyon bottom, canyon summit, ridge top, canyon side, and bottom flat. Associated vegetation included bluebunch wheatgrass [*Pseudoroegneria spicata* (Pursh) A. Love], Wyoming big sagebrush (*Artemisia tridentata* Nutt. subsp. *wyomingensis* Beetel & Young), western yarrow (*Achillea millefolium* L. var. *occidentalis* DC.), buckwheat (*Eriogonum* sp.), scabland sagebrush [*Artemisia rigida* (Nutt.) Gray], Cusick's bluegrass (*P. cusickii* Vasey), Idaho fescue (*Festuca idahoensis* Elmer), yellow rabbitbrush [*Chrysothamnus viscidiflorus* (Hook.) Nutt.], rubber rabbitbrush [*Ericameria nauseosa* (Pallas ex Pursh) Nesom & Baird], phlox (*Phlox* sp.), needle and thread grass [*Hesperostipa comata* (Trin. & Rupr.) Barkworth], and Indian ricegrass [*Achnatherum hymenoides* (Roemer & J.A. Schultes) Barkworth]. The 314 plants (G0 generation) were potted, maintained in the greenhouse during the winter of 1998, and transplanted in the spring of 1999 to a field near Logan, UT. Seed from the original 314 plants was harvested and composited, in equal amounts per collection location, to form the G1 generation.

DNA fingerprinting was used to compare 34 Reliable G0 plants (*P. secunda* ssp. *sandbergii*), with sample populations of 'Sherman' (*P. secunda* ssp. *ampla*) (Alderson and Sharp, 1995), 'Canbar' (*P. secunda* ssp. *canbyii*) (Alderson and Sharp, 1995), and experimental germplasm originating near Mountain Home, ID (*P. secunda* ssp. *sandbergii*) (Larson et al., 2001). The 34 Reliable G0 plants were from 19 of the 28 YTC collection sites and represented all seven ecological sites. Results indicated that Sherman and Canbar were genetically uniform apomictic cultivars and were easily distinguished from Reliable and Mountain Home germplasms by DNA fingerprinting. Reliable also displayed apomictic uniformity within collections, but contained a wide diversity of genotypes among collections, and was not as easily distinguished from the Mountain Home germplasm (Larson et al., 2001). However, a conservative permutation test (Leonard et al., 1999) showed that Reliable was significantly different than Mountain Home, even though a relatively small percentage of DNA markers discriminated the two germplasms. We observed a range of phenotypes in the Reliable G1 field, also suggesting wide genetic diversity.

Reliable has been successfully established in several trials in Utah and Idaho and at the YTC. Sandberg bluegrass is an important understory grass in the bluebunch wheatgrass–sagebrush ecological sites of the Intermountain and Northwest regions of the USA. It is a medium-lived, perennial bunchgrass valuable for soil erosion control, spring livestock and wildlife grazing, and biodiversity. It resists trampling and is often one of the first species to reestablish on sites disturbed by fire, large equipment and vehicles, and animals. Reliable's intended use is for rehabilitation and restoration of western rangelands. It may be particularly useful as a pioneer plant species on severely disturbed sites, such as military training sites and after wildfires.

The USDA-ARS Forage and Range Research Laboratory, Logan, UT, will maintain G1 and G2 generation seed. Generation G3 seed will be produced under contract (currently with L&H Seed, Inc, Connell, WA) and be made available to growers by the Utah Crop Improvement Association (435–797–2082). Seed through the G5 generation will be eligible for certification as Selected Class (natural track) germplasm. Information and small seed quantities will be made available on request to the corresponding author. Appropriate recognition should be made if this germplasm is used to develop new cultivars.

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